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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,302	10/03/2003	Yasutaka Nishida	11995/3	9632

7590 09/02/2004

KENYON & KENYON
Suite 700
1500 K Street, N.W.
Washington, DC 20005

EXAMINER	
MAGEE, CHRISTOPHER R	
ART UNIT	**PAPER NUMBER**
2653	

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/677,302	**Applicant(s)** NISHIDA ET AL.
	Examiner Christopher R. Magee	**Art Unit** 2653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/3/2003.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/785, 471, filed on 02/20/2001.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> *(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (hereinafter Tanaka) (US 5,584,727) in view of Katsumata et al. (hereinafter Katsumata) (US 5,181,149) and further in view of Nakamigawa et al. (hereinafter Nakamigawa) (JP 10-003643).

- Regarding claims 1-3, Tanaka shows a perpendicular magnetic recording system (see Figure 5) comprising a perpendicular magnetic recording medium 2 having a soft magnetic layer 2b and a magnetic recording head 30 for performing magnetic recording on said perpendicular magnetic recording medium, said magnetic recording head having a main pole 511 for finally recording a magnetization reversal on said perpendicular magnetic recording medium 2.

Tanaka does not show a magnetic read head comprises an upper shield, a lower shield and a read element provided between said upper shield and a lower shield.

With that in mind, Katsumata teaches a magnetic recording/reproducing head assembly with a main pole 4, wherein the magnetic read head comprises an upper shield 2 (i.e., auxiliary pole 2), a lower shield 10 and a read element 3 (i.e., magnetic detecting element 3) provided between said upper shield and a lower shield (Figure 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetic head of Tanaka with a magnetic read head which comprises an upper shield, a lower shield and a read element.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the magnetic head of Tanaka with a magnetic read head which comprises an upper shield, a lower shield and a read element in order to eliminate noises, such as ghost etc., during reproduction, which would be caused by a false gap of an induction head assembly (*Katsumata*; col. 11, lines 1-5).

Further, Tanaka and Katsumata do not exemplify a perpendicular magnetic recording system satisfying the following equation:

$T_{b1} < (B_{s1} \text{ x } T_m \text{ x } T_{ww}) / 2(B_{s2} \text{ x } (T_m + T_{ww}))$,

where T_{b1} is the thickness of said soft magnetic underlayer in said perpendicular magnetic recording medium, B_{s2} is the saturation flux density of the same, T_m is the thickness of said main pole along a track direction in the vicinity of its floating surface, T_{ww} is the track width of the same, and B_{s1} is the saturation flux density of the same. However, Tanaka discloses the following values: $B_{s1} = 1.52$ T (col. 7, line 20); $T_m = 5$ μm; and $T_{ww} = 1$ μm (col. 9, lines 1-3).

Yet, Nakamigawa discloses a perpendicular magnetic recording medium with the following values: $T_{b1} = 0.5\ \mu m$ (page 2, section 0007) and $B_{s2} = 0.50$ T (5,000 G) (page 3, section 0012).

Substituting the specified values into the above equation results a $T_{b1calculated} = 1.27\ \mu m$, which is greater than $0.5\ \mu m$. Therefore, the equation is satisfied, i.e., $1.27\ \mu m > 0.5\ \mu m$.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the perpendicular magnetic recording system of Tanaka and Katsumata with the perpendicular magnetic recording medium as taught by Nakamigawa .

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the perpendicular magnetic recording system of Tanaka and Katsumata with the perpendicular magnetic recording medium as taught by Nakamigawa in order to increase the recording density of the perpendicular magnetic recording medium and to show the relationship of the saturation flux density to the thickness of the soft magnetic underlayer.

- Regarding claim 4, Tanaka discloses a track width, T_{ww}, less than $0.5\ \mu m$ (col. 9, lines 60-63).
- Regarding claim 5, Tanaka or Katsumata do not set forth the dimensions in these claims. However, Katsumata teaches that G_{L1} in Figure 3, is the distance between the main pole 4 and the upper shield 2 (i.e., auxiliary pole 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the perpendicular magnetic recording head of Tanaka and

Katsumata with a distance between the main pole and auxiliary pole being greater or equal to 5 μm.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide the perpendicular magnetic recording head of Tanaka and Katsumata with a distance between the main pole and auxiliary pole being greater or equal to 5 μm in order to maintain high reproduction resolution (*Katsumata*; col. 8, lines 22-34)

- Regarding claim 6, Nakamigawa discloses the thickness, T_{b1}, of the soft magnetic underlayer in the perpendicular magnetic recording medium is smaller than or equal to 0.2 μm (page 2, section 0007).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (703) 605-4256. The examiner can normally be reached on M-F, 8: 00 am-5: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C R Magee
Christopher R. Magee
Patent Examiner
Art Unit 2653

August 21, 2004

William Korzuch
WILLIAM KORZUCH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600